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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/824,225 | 04/14/2004 | Dieter Ritter | P04,0101 | 6358 |
| 7590 SCHIFF HARDIN LLP Patent Department 6600 Sears Tower 233 South Wacker Drive Chicago, IL 60606 | | 03/15/2007 | EXAMINER ARTMAN, THOMAS R | |
| | | | ART UNIT 2882 | PAPER NUMBER |
| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE | | |
| 3 MONTHS | 03/15/2007 | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/824,225 | RITTER, DIETER | |
| | Examiner | Art Unit | |
| | Thomas R. Artman | 2882 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 27 February 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 19 August 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 3 is objected to because, at line 3, it appears as though the term "30" was intended to be "3D."

Furthermore, in lines 3-4, the phrase "3D image dataset series of 2D projections" does not make sense because the 3D image dataset is a set of optical data, where the 2D projections are x-ray projections. Based upon the present amendments to claims 4, 9 and 10, it appears as though the phrase "series of 2D projections" should have been deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Alexandrescu (US 6,272,368 B1).

Regarding claims 1 and 7, Alexandrescu discloses an X-ray apparatus and method of use, including:

- a) disposing an examination subject 6 disposed between an x-ray source 3 and a radiation detector 2 in an x-ray imaging system (Fig.5), where the source and detector are mounted upon a carrier support 1,
- b) moving the carrier support relative to the examination subject for acquiring a series of 2D projections of the examination subject with the source and detector, and
- c) performing a distance measurement via active triangulation (col.3, lines 21-24) with an optical 3D sensor 11, where the optical 3D sensor includes:
 - d) a light source 12 mounted to the carrier support 1 that emits a light beam that is detectable on a surface of the subject and an optical detector 13, mounted on the carrier support, that detects the light beam on the surface of the subject and that emits a detector output dependent thereon, and
 - e) moving the carrier support relative to the examination subject to acquire a 3D image dataset with the optical 3D sensor, that represents a height above a 2D plane from the distance measurement and the detector output of the optical detector, conforming to at least a portion of the surface of the examination subject (col.3, lines 9-35 and lines 54-61).

With respect to claims 2-5 and 8-11, Alexandrescu further discloses that the carrier support is a C-arm that is isocentrically arranged, where the supporting arrangement moves in both circumferential and angular movements while acquiring the 3D image dataset of the patient surface (col.2, lines 44-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexandrescu, as applied to claims 1 and 7 above, in view of Collins (US 6,535,574 B1).

With respect to both claims, Alexandrescu does not specifically disclose a computer for calculating a volume dataset from the series of 2D projections, nor the additional practice of combining the 3D image dataset with the volume dataset by fusion or superimposition. The use of the 3D image dataset of the surface of the patient is limited to preventing collisions between the patient and the imaging system.

Collins teaches the practice of generating and combining an X-ray volume dataset, calculated from a series of 2D projections, with a 3D image dataset 944 of a surface of the patient that was imaged by the X-ray system (Figs. 4, 5a; col.10, lines 6-52). In this way, the 3D image dataset is useful to provide accurate patient positioning information in order to perform repeat X-ray images at later times and to perform accurate radiation therapy (see at least Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Alexandrescu to generate and combine an X-ray volume dataset with a 3D image dataset in order to improve patient positioning accuracy for future imaging or radiation therapy.

Response to Arguments

Applicants' arguments with respect to the 35 USC 103(a) rejections of claims 1 and 7 as being obvious over Navab in view of Carol have been fully considered and are persuasive. The present amendments to the claims overcome the rejections.

Applicants' arguments with respect to the 35 USC 102(b) rejections of claims 1 and 7 as being anticipated by Alexandrescu have been fully considered but are not persuasive. Applicants assert that Alexandrescu does not use the C-arm movement specifically for the purpose of acquiring the 3D image dataset using the optical 3D sensor 11 mounted to the C-arm (Fig.5). The examiner respectfully disagrees.

At least from col.3, lines 33-36 and lines 51-60, it is clear that the optical 3D sensor of Alexandrescu is performing the claimed acquisition of the 3D image dataset while the C-arm is moving; that is to say, the motion of the C-arm is happening simultaneously with the collection of the 3D image dataset. As a result, the claim limitation is met. It is the examiner's position that the ability of the optical 3D sensor of Alexandrescu to acquire a 3D image dataset without movement of the C-arm does not preclude anticipation of the claimed invention.

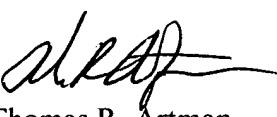
Therefore, Applicants' arguments are not persuasive, and the rejections have been maintained above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Thomas R. Artman
Patent Examiner